

"cloud-glow apparatus," by which somewhat similar results have been obtained with steam and sal-ammoniac fumes, induces me to publish my own observations, in the hope that some more competent physicist and mathematician may furnish a satisfactory theoretical elucidation. Lord Rayleigh, I find, has carefully examined the properties of the light reflected from an acidified solution of thiosulphate; but its action upon transmitted light appears to have escaped his attention. While Prof. Kiessling's method affords an independent confirmation of the phenomena in question, the thiosulphate solution lends itself much more readily to a study of the successive phases owing to the slow and steady nature of the action and the ease with which, by altering the strength of solution and the depth of the layer interposed, the circumstances can be adapted to the most favourable observation of any portion of the series.

J. SPEAR PARKER

Fall of Autumnal Foliage

THAT the causes of the fall of autumnal foliage have been for some time removed from the *terra incognita* of the natural history of plants is clear from the fact that the threefold reason is given by Sir J. D. Hooker in so elementary a botanical work as his "Primer of Botany" (Macmillan). The cause assigned by Mr. Henslow in NATURE (vol. xxxi. p. 434) will be seen, on reference to the little work mentioned, to be only one of the causes which operate in nature. I may add that I have more than once verified the third reason assigned by Sir J. D. Hooker by experiments on young and old rhododendron leaves, and on leaves of other plants, for my botany classes, and have been surprised at the great difference in the weight of mineral-ash left by equal weights of calcined leaves from the same plant, according as they were culled at the beginning or the end of the season.

ALEXANDER IRVING

Wellington College, Wokingham, March 14

[We do not think that either our correspondent or the Rev. G. Henslow has seized the point of Mr. Fraser's letter. This was not an inquiry as to the *modus operandi* by which leaves fall from the plant—a phenomenon which, as Mr. Fraser points out, occurs in India as in Europe. The process is in fact as well understood as anything in the life of the plant. What, however, Mr. Fraser drew attention to was the cause of the *autumn periodicity* of the fall in the higher latitudes as contrasted with what takes place for example in India, where the leaves, as he states, "drop off gradually in batches." Neither Mr. Henslow nor Mr. Irving explain why when a traveller from the south reaches Alexandria he finds that "here trees first become deciduous." Leaves fall everywhere, but why north of Alexandria *en masse* in the autumn and south of it in continuous dribbles?—ED.]

Human Hibernation

My letter on the Hibernation of the Siberian mammoth has been followed by two others, extremely interesting, but dealing, I may say exclusively, with the question of human hibernation, and the evidence offered in support of it; this raises a very important consideration, concerning which I ask leave to offer a few remarks:—The "fact," as stated by Mr. Braid, is that credible persons witnessed the burial of a man in a state of sleep or torpor, and that the same man was dug up alive some months afterwards. Why should we not believe this? The answer is not an easy one, nor can it be given in few words, but is in great measure that the same kind of almost unimpeachable testimony is to be had for any number of astounding occurrences, and that if the testimony is to be believed in one case, why should it not be accepted in all others? why are we driven to be so mistrustful? On this I will only say a few words, as your space is so limited. We know that some 5000 or 6000 years ago there existed a people—the Accadians—who, in their cuneiform writings, have left the most complete account of their daily lives and doings. We learn that these men regulated almost every act by the predictions of magicians, astrologers, or one form or another of impostors. We see, therefore, that the world was even then divided into knaves and dupes. Now this has been clearly going on ever since, and probably for indefinite ages before. The knaves having begun as such, have, for the most part, but by no means exclusively, developed into honest, or partially honest, fanatics; the dupes have greatly developed their credulity; and the stage had been reached that an individual

with a sane and healthy mind was, if he escaped death, held in such disfavour as to stand a very poor chance in the struggle for existence. The scientific and critical revival of late years has arisen, I believe, partly because life is more secure, and toleration more prevalent, the virtually diseased mental condition is allowed to recover itself. To apply these views to the explanation of the particular case in point above referred to, we must remember that the burial was performed by men, descendants of others wholly unscrupulous, magicians, tricksters, who had probably followed the same calling for ages, and acquired an hereditary skill in such deceptions. Those who have witnessed, as I have done, their marvellous feats—for instance, of the native Indian jugglers—cannot doubt but that the case described was at all events within their power.

Messrs. Maskelyne and Cook similarly can bewilder and defeat the closest "scientific" examination; and is it not obvious but that even here, in the centre of the civilised modern world, the most clumsy impostors are daily bewildering and befoling people who believe themselves to be the possessors of highly cultivated and healthy intellects.

C. K. BUSHE

Athenæum Club

Bos Primigenius

IN NATURE, March 12 (p. 451), a specimen of the jaw of this animal is referred to as having been exhibited at a meeting of the Royal Physical Society of Edinburgh, followed by the remark: "It is apparently the only specimen that had been seen in Britain." Its size is given as 18½ inches in extreme length. I possess a perfect ramus of a jaw of this species, excavated near Ilford, Surrey, a few years ago, which is fully 21 inches in length in a straight line, and 28 inches measured along the outer curve. There are, I am informed, many specimens of the jaws of *Bos primigenius* in the national collection (presented by the late Sir Antonio Brady), from the same district as my specimen.

West Bank, York

JAS. BACKHOUSE

THE BRITISH ASSOCIATION AND LOCAL SOCIETIES

ON behalf of the recently-appointed Corresponding Societies Committee of the British Association, the President and Secretaries are now calling the attention of Local Scientific Societies to certain Rules of the Association adopted at the meeting of the General Committee in November last. It will be remembered that during the last few years the subject of the relation of Local Scientific Societies to the British Association has received considerable attention, and that an opinion has been strongly expressed that the Local Scientific Societies and the British Association might, without any considerable sacrifice of independence, usefully cooperate in facilitating the conduct of investigations into local phenomena such as are frequently undertaken by Committees of the Association.

With this purpose in view the Rules, of which we print a copy, have been prepared, and have now been finally adopted by the General Committee of the Association; and under these provisions a Corresponding Societies Committee has been appointed. To these Rules we would ask the earnest attention of the many local societies throughout the kingdom:—

"Corresponding Societies"

"(1) Any Society is eligible to be placed on the List of Corresponding Societies of the Association which undertakes local scientific investigations, and publishes notices of the results.

"(2) Applications may be made by any Society to be placed on the List of Corresponding Societies. Application must be addressed to the Secretary on or before June 1, preceding the annual meeting, at which it is intended they should be considered, and must be accompanied by specimens of the publications of the results of the local scientific investigations recently undertaken by the Society.

"(3) A Corresponding Societies Committee shall be

annually nominated by the Council and appointed by the General Committee for the purpose of considering these applications, as well as for that of keeping themselves generally informed of the annual work of the Corresponding Societies, and of superintending the preparation of a list of the papers published by them. This Committee shall make an annual report to the General Committee, and shall suggest such additions or changes in the List of Corresponding Societies as they may think desirable.

"(4) Every Corresponding Society shall return each year, on or before June 1, to the Secretary of the Association, a schedule, properly filled up, which will be issued by the Secretary of the Association, and which will contain a request for such particulars with regard to the Society as may be required for the information of the Corresponding Societies Committee.

"(5) There shall be inserted in the Annual Report of the Association a list, in an abbreviated form, of the papers published by the Corresponding Societies during the past twelve months, which contain the results of the local scientific work conducted by them; those papers only being included which refer to subjects coming under the cognisance of one or other of the various sections of the Association.

"(6) A Corresponding Society shall have the right to nominate any one of its members, who is also a member of the Association, as its delegate to the annual meeting of the Association, who shall be for the time a member of the General Committee.

"Conference of Delegates of Corresponding Societies"

"(7) The Delegates of the various Corresponding Societies shall constitute a Conference, of which the Chairman, Vice-Chairmen, and Secretaries shall be annually nominated by the Council, and appointed by the General Committee, and of which the members of the Corresponding Societies Committee shall be *ex officio* members.

"The Conference of Delegates shall be summoned by the Secretaries to hold one or more meetings during each annual meeting of the Association, and shall be empowered to invite any member or associate to take part in the meetings.

"The Secretaries of each Section shall be instructed to transmit to the Secretaries of the Conference of Delegates copies of any recommendations forwarded by the Presidents of Sections to the Committee of Recommendations bearing upon matters in which the co-operation of Corresponding Societies is desired; and the Secretaries of the Conference of Delegates shall invite the authors of these recommendations to attend the meetings of the Conference and give verbal explanations of their objects and of the precise way in which they would desire to have them carried into effect.

"It will be the duty of the Delegates to make themselves familiar with the purport of the several recommendations brought before the Conference, in order that they and others who take part in the meetings may be able to bring those recommendations clearly and favourably before their respective Societies. The Conference may also discuss propositions bearing on the promotion of more systematic observation and plans of operation, and of greater uniformity in the mode of publishing results."

UNDERGROUND NOISES HEARD AT CAÏMAN-BRAC, CARRIBEAN SEA, ON AUGUST 26, 1883

THE following letter describes certain underground noises heard on the day of the great eruption of Krakatoa, in a little island of the Carribean Sea, very near the antipodes of the Sunda Strait. It is possibly an interesting instance of propagation of sound through the whole diameter of the earth. I shall first translate the

letter of my correspondent, then add some explanatory remarks:—

"South of Cuba, in 80° long. W., and 20° lat. N., the three little islands, Great Caïman, Little Caïman, and Caïman-Brac, are inhabited by a population of tortoise fishermen; there are also a life-boat station and Lloyd's agent. These islands are indeed in the path of the great cyclones of the Antilles, and they witness many shipwrecks.

"In the month of September 1883, as I was in the island Utila, near the coast of Honduras, we heard the first news of the great eruptions of Krakatoa, and talking about those tremendous cataclysms, I met Capt. Robert Woodville, who had just received a letter from the Caïmans; he told me what follows:—

"On Sunday, August 26, the inhabitants of Caïman-Brac were astonished by a noise like the rolling of a distant thunderstorm; the sky was fine, and they at first thought it was a skirmish between a Spanish cruiser and some Cuban smugglers. On the south side of the island nothing was to be seen; they ran across the island, and northward all was quiet too; no smoke nor ship was in sight. The cannonade still continued, and going back again they recognised that the noise came from underground. They were much afraid, and expected their island would soon subside in the sea, or be turned into a volcano. By degrees the detonations ceased, and their fears were quieted. But the phenomenon was not forgotten, and was still talked about when the first news of the Krakatoa eruption came. They made the remark that the Caïmans and Sunda Strait are nearly at the antipodes of each other, and the hypothesis of a correlation between the two phenomena was propounded. . . .

"(Signed) EDMUND ROULET"

I will not be too sanguine, and accept without criticism so abnormal a fact of the propagation of underground sounds from Krakatoa to the Caïmans through the whole mass of the globus; but I will try to show the reasons which tell in favour of such a bold hypothesis, and lead me to accept it provisionally. There are, it seems to me, plausible grounds for admitting that the subterranean noises heard at the Caïmans were the repercussion of the explosions of the great Krakatoa eruption:—

(1) These noises heard at the Caïmans did not come from one of the numerous volcanoes of Central America: if a great eruption had been known on the same day, the inhabitants of Caïman-Brac and Utila would have found out for themselves the co-relation between the two phenomena. From the nineteenth catalogue of C. W. C. Fuchs (*Mineral. Mitth. v. Tschermak*, vi. 185, 1884) we know of the following eruptions which happened in the summer of 1883. The Cmotepac, an insular volcano in the middle of the lake Nicaragua, was in eruption on June 19, opening a new crater, and giving way to abundant lava streams; in the month of August the lavas were still burning. Cotopaxi (in the State of Ecuador) had at the end of August (the exact time is not given) a short, but very strong eruption, accompanied by violent earthquakes. I cannot, however, believe that a great eruption, with noises audible at a distance of 1100 to 2300 kilometres, would not have been better noted, if it had taken place on the same day as the great eruption of Krakatoa. This last event has been enough talked about over the whole world to call attention to such a coincidence if it had really existed.

(2) As to the explanation of the Caïman noises by an unnoticed submarine eruption in the vicinity, I have only to state that the great Antilles are not a volcanic region: the nearest volcanic regions are the Little Antilles and the west coast of Central America, both which are too far to allow such an interpretation of the noises heard at the Caïmans.